

PreCalc 30

Name

Quiz 8

PRACTICE

30.9	2	3	4
Outcome 8a: I can demonstrate an understanding of logarithmic functions	Express a logarithmic expression as an exponential expression and vice versa. Evaluate logs both by inspection and with technology Identify transformations and properties of the graph Solve basic logarithmic equations Simplify basic log expressions	Evaluate logs using benchmarks Sketch log functions with and without technology Solve advanced logarithmic equations and identify extraneous roots Simplify advanced log expressions	I can answer theoretical questions I can articulate my reasoning I can solve situational questions

Level 2

1. Convert to a logarithmic equation

a. $3^4 = 81$

b. $12^x = y$

2. Convert to an exponential equation

a. $\log_5 125 = 3$

3. Evaluate by inspection.

a. $\log_2 32$

4. Evaluate using technology.

a. $\log 412$

b. $\log_3 11$

5. Solve for x.

a. $\log_2 x = 4$

b. $\log_x 36 = 2$

6. Simplify and evaluate.

a. $\log_4 8 + \log_4 2$

b. $\log_5 250 - \log_5 2$

Level 3

7. Evaluate, to the nearest tenth, using benchmarks.

a. $\log_2 10$

8. Simplify each expression and write as a single logarithm.

a. $2\log_3 6 - 3\log_3 2 + \log_3 18$

b. $\log_2 5x^2y^3 - \log_2 20x^4y + \log_2 2xy^6$

9. Expand using the laws of logarithms.

a. $\log_{12}(xy^2z^5)^3$

b. $\log_5 \frac{x^5}{y^3\sqrt{z}}$

10. Solve for x.

a. $5 = \log_2 x + \log_2 2x$

b. $3\log_6 x = \log_6 9 + \log_6 24$

c. $4(4)^{x+2} = 200$

e. $\log_6(x + 3) - 2 = -\log_6(x - 2)$

d. $\log_2(4x+10) - \log_2x = 3$

f. $2^{x+3} = 6^{x-1}$

Level 4

11. The population of a high school is growing by 1.5% per year. Currently there are 974 students in the high school.
- Write an exponential equation to model the population of the school, p , after t years.
 - What population should be expected at the high school in five years?
 - When will the population reach 1200 students?

12. Find the error.

$$\log 0.1 < 3\log 0.1$$

$$\text{Since } 3\log 0.1 = \log 0.1^3,$$

$$\log 0.1 < \log 0.1^3$$

$$\log 0.1 < \log 0.001$$

$$\text{Therefore } 0.1 < 0.001$$

13. The intensity of sound is measured in decibels (dB). The level of a sound, L , is given by

$$L = 10 \log \frac{I}{I_0},$$
 where I is the intensity of the sound and I_0 is the faintest sound detectable to

humans. A sound engineer increases the volume at a concert from 90 decibels (dB) to 93 dB.

Show that this increase approximately doubles the intensity of the sound.